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09/720,132

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Jacques Meyer

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08/12/2004

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EXAMINER

WARE, CICELY Q

ART UNIT

PAPER NUMBER

2634

9

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/720,132

Applicant(s)

MEYER, JACQUES

Examiner

Cicely Ware

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 June 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4-12 and 15-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-12, 15 and 16 is/are allowed.
- 6) ☒ Claim(s) 4-6 and 17-19 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Claims 1-15 have been renumbered as claims 4-20. Applicant has submitted that claims 1-3 have been canceled therefore subsequent claims have to be referenced in sequence starting with claim 4.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 4 and 6 are rejected under 35 U.S.C. 102(e) as being anticipate by Klank et al. (US Patent 6,226,337).

(1) With regard to claim 4, Klank et al. discloses an OFDM demodulator comprising a fast Fourier transform circuit for analyzing a received signal in a window corresponding to one symbol, each symbol carrying several phase and amplitude modulated carriers, some of which, shifted in frequency in a predetermined way from one symbol to the next one, form pilots (col. 1, lines 32-38, col. 6, lines 56-63, col. 9, lines 52-67, col. 10, lines 1-6, 30-32, col. 11, lines 56-61, col. 14, lines 30-51); a bi-dimensional filter for interpolating, from anchors corresponding to the pilots such as

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received from several consecutive symbols (col. 4, lines 59-67, col. 5, lines 1-2), the distortion undergone by each carrier (col. 7, lines 55-59, col. 11, lines 62-67, col. 12, lines 6-12, 33-67); means for correcting window shifting with respect to an optimal position (col. 10, lines 47-65, col. 11, lines 1-3, 22-47); and means for correcting each distortion according to window shifting corrections performed respectively for the symbol associated with the distortion and for the symbols associated with the anchors used to interpolate the distortion (col. 11, lines 4-47).

Klank et al. does not explicitly disclose an FFT. However it is well known in the art that a DFT algorithm is most easily executed using an FFT algorithm.

(2) With regard to claim 6, claim 6 inherits all the limitations of claim 4. Klank et al. further discloses wherein each distortion is, in the frequency field after Fourier transform, a weighted sum of two anchors of the same position in a preceding symbol and in a following symbol, to which anchors have been added respective phases corresponding to the shiftings undergone by the analysis window for the preceding and following symbols, and to which anchors has been subtracted a phase corresponding to the shifting undergone by the analysis window for the symbol associated with the distortion (col. 7, lines 17-19, col. 9, lines 63-67, col. 10, lines 44-65, col. 12, lines 13-32, 40-64, col. 13, lines 8-13).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klank et al. (US Patent 6,226,337) as applied to claim 4 above, in view of Ikeda et al. (US Patent 5,506,836).

With regard to claim 5, claim 5 inherits all the limitations of claim 4. However Klank et al. does not disclose wherein the means for correcting the window shifting comprise a phase-locked loop synchronized on a correlation signal obtained by a correlation product between the received signal and this same signal delayed by one symbol each symbol being preceded by a guard interval corresponding to a copy of the end of the symbol.

However Ikeda et al. discloses an OFDM demodulation apparatus (Fig. 5, (890), Fig. 3 (853, 854, 856, 869, 868)) means for correcting the window shifting comprise a phase-locked loop synchronized on a correlation signal obtained by a correlation product between the received signal and this same signal delayed by one symbol each symbol being preceded by a guard interval corresponding to a copy of the end of the symbol (col. 7, lines 66-67, col. 8, lines 1-55, col. 13, lines 5-15, 53-57, 63-67, col. 14, lines 1-5).

Therefore it would have been obvious to one of ordinary skill in the art to modify the invention of Klank et al. to incorporate means for correcting the window shifting, wherein the means comprise a phase-locked loop synchronized on a correlation signal obtained by a correlation product between the received signal and this same signal delayed by one symbol each symbol being preceded by a guard interval corresponding to a copy of the end of the symbol in order to correctly reproduce the carrier wave signals and clock signal and to correctly generate the DFT(FFT) time window.

6. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klank et al. (US Patent 6,226,337) in view of Ikeda et al. (US Patent 5,506,836).

(1) With regard to claim 17, Klank et al. further discloses a method of fast Fourier transform (FFT) analysis window displacement compensation in a COFDM modulator, comprising: receiving a radio-transmitted signal in a window corresponding to one symbol, the symbol carrying a plurality of phase and amplitude modulated carriers, one or more of the carriers are shifted in frequency in a predetermined way from one symbol to the next symbol and form pilots, and extracting the symbols and converting these symbols into digital signals (col. 1, lines 5-8, col. 6, lines 17-19, col. 7, lines 51-67, col. 8, lines 1-7); receiving the windows and performing a fast Fourier transform with the windows and outputting a transformed signal that includes complex coefficients (col. 3, lines 22-35). However Klank et al. does not disclose receiving the digital signals and determining and readjusting the position of the windows; receiving a position signal outputting a conversion signal that is corrected for distortion; receiving

the transformed signal and the conversion signal, including anchors corresponding to pilots received from several consecutive symbols, and to providing an interpolated distortion signal; and receiving the interpolated signal and outputting a corrected complex coefficients signal.

However Ikeda et al. further discloses receiving the digital signals and determining and readjusting the position of the windows (col. 13, lines 30-32, col. 14, lines 35-67, col. 15, lines 1-27); receiving a position signal outputting a conversion signal that is corrected for distortion (Fig. 3 (868), col. 13, lines 38-46, 63-67, col. 14, lines 1-5); receiving the transformed signal and the conversion signal, including anchors corresponding to pilots received from several consecutive symbols, and to providing an interpolated distortion signal of distortion undergone by each carrier (Fig. 3 (863, 864, 865, 868), Fig. 4, col. 13, lines 38-46, 63-67, col. 14, lines 1-5, col. 15, lines 27-38); and receiving the interpolated signal and outputting a corrected complex coefficients signal (Fig. 3 (868)).

Therefore it would have been obvious to one ordinary skill in the art to modify Klank et al. to incorporate receiving the digital signals and determining and readjusting the position of the windows; receiving a position signal outputting a conversion signal that is corrected for distortion; receiving the transformed signal and the conversion signal, including anchors corresponding to pilots received from several consecutive symbols, and to providing an interpolated distortion signal of distortion undergone by each carrier; and receiving the interpolated signal and outputting a corrected complex coefficients signal in order to enable stable reproduction of a clock signal and as a result

enable accurate demodulation with the stable operation of the PLL circuit and the DFT(FFT) circuit (Ikeda et al., col. 2, lines 62-63, col. 3, lines 4-6).

(2) With regard to claim 18, claim 18 inherits all the limitations of claim 17. Klank et al. further discloses in (Fig. 8 (DSE), Fig. 9 (FFT, FFTW, COR)) the method comprising receiving the transformed signal and outputting a delayed transformed signal.

(3) With regard to claim 19, claim 19 inherits all the limitations of claim 17. Ikeda et al. further discloses the method further comprising generating a phase-locked loop synchronized on a correlation signal obtained by a correlation product between the received signal and this same signal delayed by one symbol each symbol being preceded by a guard interval corresponding to a copy of the end of the symbol (col. 7, lines 66-67, col. 8, lines 1-55, col. 13, lines 5-15, 53-57, 63-67, col. 14, lines 1-5).

### ***Allowable Subject Matter***

7. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 7-12, 15-16 are allowed.

9. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a COFDM demodulator. Prior art references show similar methods but fail to teach **“the conversion circuit comprising first, second, and third analysis window shift value registers coupled to a first**



**multiplexer; fourth, fifth, and sixth analysis window shift value registers coupled to a second multiplexer; the first and second multiplexers each having an output coupled to respective inputs of first and second adders; the first and second adders each having an output coupled to respective first and second multipliers; the first and second multipliers each having an output coupled to respective first and second polar-to-cartesian converters; and the first and second polar-to-cartesian converters each having an output coupled to respective second inputs of the first and second multipliers of the interpolation circuit; the interpolation circuit comprising first, second, second and third anchor input registers coupled to a first multiplexer; fourth, fifth, and sixth anchor input registers coupled to a second multiplexer; and first and second multipliers each having inputs coupled respectively to the first and second multiplexers and each further having an output coupled to a common adder", as in claim 7.**

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 703-305-8326. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

*Cicely Ware*

cqw  
August 4, 2004



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**SUPERVISORY PATENT EXAMINER**  
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